

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
21 October 2004 (21.10.2004)

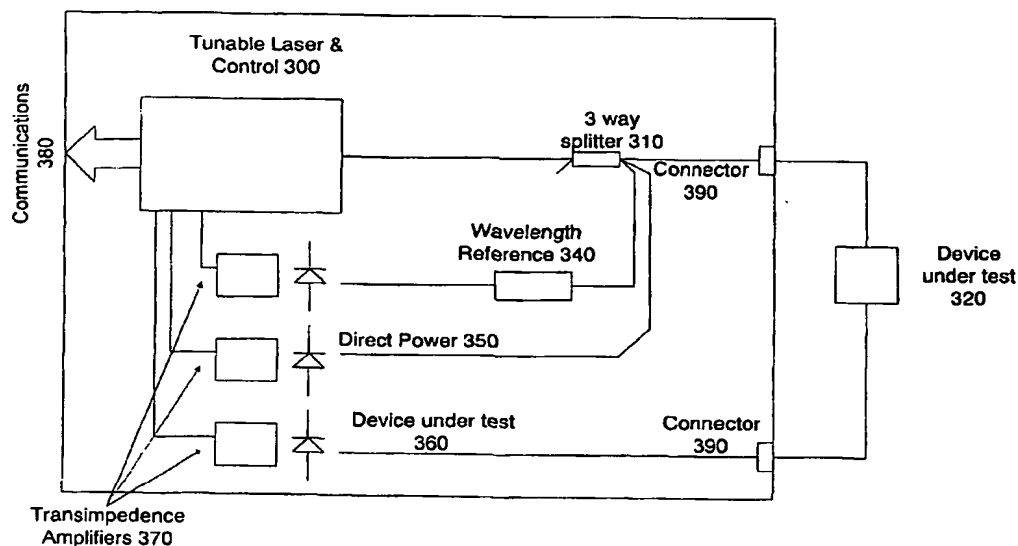
PCT

(10) International Publication Number
WO 2004/091059 A3

- (51) International Patent Classification⁷: **H01S 5/0625**, 5/068
- (21) International Application Number: PCT/IE2004/000056
- (22) International Filing Date: 14 April 2004 (14.04.2004)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
S2003/0281 14 April 2003 (14.04.2003) IE
- (71) Applicant (for all designated States except US): **INTUNE TECHNOLOGIES LIMITED** [IE/IE]; 9c Beckett Way, Park West Business Park, Dublin 12 (IE).
- (71) Applicants and
(72) Inventors (for US only): **MULLANE, Tommy** [IE/IE]; 9c Beckett Way, Park West Business Park, Dublin 12 (IE).
MCDONALD, David [IE/IE]; 9C Beckett Way, Park West Business Park, Dublin 12 (IE).
- (72) Inventors; and
(75) Inventors/Applicants (for US only): **FARRELL, Tom** [IE/IE]; 9C Beckett Way, Park West Business Park, Dublin 12 (IE). **POLLEY, Ciaran** [IE/IE]; 9C Beckett Way, Park West Business Park, Dublin 12 (IE). **O'CONNOR, Peter, B.** [IE/IE]; 9C Beckett Way, Park West Business Park, Dublin 12 (IE).
- (74) Agents: **SHORTT, Peter, Bernard et al.**; Tomkins & Co., 5 Dartmouth Road, Dublin 6 (IE).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH,

[Continued on next page]

(54) Title: METHOD AND SYSTEM FOR CONTINUOUS SWEEPING OF A TUNABLE LASER



(57) Abstract: The invention relates to a method and system for providing a set of continuous tuning regions from a discontinuously tuned laser, by providing a wavelength reference having at least first and second resonance peaks, sweeping the laser across a pre-determined wavelength range of the wavelength reference, and defining, within the laser sweep, one or more regions of continuous tuning operation of the laser, each of the regions corresponding to a response of the laser between adjacent resonance peaks of the wavelength reference. The advantage of the invention is that it provides a way for stitching together continuous regions of a multi-section tunable laser in an efficient and accurate manner.



GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:
10 February 2005

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

lional Application No

PCT/IE2004/000056

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H01S5/0625 H01S5/068

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H01S

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GLANCE B ET AL: "ONE-THZ DIGITAL RANDOM ACCESS HIGH RESOLUTION OPTICAL FREQUENCY SYNTHESIZER PROVIDING COLD-START OPERATION FROM A FREQUENCY REFERENCE" COMMUNICATIONS : CONNECTING THE FUTURE. SAN DIEGO, DEC. 2 - 5, 1990, PROCEEDINGS OF THE GLOBAL TELECOMMUNICATIONS CONFERENCE AND EXHIBITION(GLOBECOM), NEW YORK, IEEE, US, vol. VOL. 2, 2 December 1990 (1990-12-02), pages 766-767, XP000220883 ISBN: 0-87942-632-2 the whole document	1, 18, 22, 26
A	US 6 504 856 B1 (ANDERSSON LARS ET AL) 7 January 2003 (2003-01-07) column 3, line 20 - line 30; figure 4 figures 7,8	1, 18, 22, 26
-/--		

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *G* document member of the same patent family

Date of the actual completion of the international search

18 November 2004

Date of mailing of the international search report

21/12/2004

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Hervé, D

INTERNATIONAL SEARCH REPORT

In International Application No

PCT/IE2004/000056

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>SARLET G ET AL: "CONTROL OF WIDELY TUNABLE SSG-DBR LASERS FOR DENSE WAVELENGTH DIVISION MULTIPLEXING" JOURNAL OF LIGHTWAVE TECHNOLOGY, IEEE. NEW YORK, US, vol. 18, no. 8, August 2000 (2000-08), pages 1128-1138, XP000989390 ISSN: 0733-8724 the whole document</p>	1,18,22, 26
A	<p>UPSCHULTE B L ET AL: "MEASUREMENTS OF CO, CO₂, OH, AND H₂O IN ROOM-TEMPERATURE AND COMBUSTION GASES BY USE OF A BROADLY CURRENT-TUNED MULTISECTION INGAASP DIODE LASER" APPLIED OPTICS, OPTICAL SOCIETY OF AMERICA, WASHINGTON, US, vol. 38, no. 9, 20 March 1999 (1999-03-20), pages 1506-1512, XP000828580 ISSN: 0003-6935 page 1508; figure 3</p>	1,18,22, 26

INTERNATIONAL SEARCH REPORT

International Application No
PCT/JP2004/000056

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 6504856	B1	07-01-2003	SE 519081 C2	07-01-2003
			AU 2304699 A	23-08-1999
			CA 2316820 A1	12-08-1999
			EP 1050088 A1	08-11-2000
			JP 2002503036 T	29-01-2002
			SE 9800143 A	22-07-1999
			WO 9940654 A1	12-08-1999